

States, and, indeed, wherever meteorology is studied. The other subjects treated in these papers include:—

- (1) The changes in the hourly variation of the barometer in fine and in cloudy weather at Ben Nevis, Fort William, and several other stations.
- (2) The general meteorological conditions on Ben Nevis in clear and in foggy weather.
- (3) Atmospheric dust on Ben Nevis.
- (4) The pumping effect on a barometer of strong winds.
- (5) The difference in the direction of the wind at Ben Nevis from that at sea-level.
- (6) The change of temperature with height in anticyclones.
- (7) The diurnal ranges of the Ben Nevis and Fort William barometers when both are reduced to sea-level by the usual tables.
- (8) The diurnal range of the variability of temperature from day to day at Ben Nevis and some other places.
- (9) The meteorological conditions at Ben Nevis during the severe frost of January and February, 1895.
- (10) The relation of wind direction to temperature and to rainfall at Ben Nevis.

The establishment of the Ben Nevis Observatories has provided meteorological data of a character unique in this country, and, indeed, in the world, owing to the position of Ben Nevis as a high-level station placed right in one of the storm-tracks of the Atlantic. But it has also led to investigations which could not otherwise have been carried out, for no increase in the amount or quality of low-level observations would have supplied the necessary data, and the high-level records got from kites or balloons are too fragmentary for the purpose.

The observatories were built with money subscribed by the public, and up to this time have been supported by subscriptions, aided by an annual payment of 100*l.* for the Ben Nevis Observatory and 250*l.* for the Fort William Observatory from the Parliamentary grant of 15,300*l.* given annually for meteorological purposes. What their future position may be depends on the recommendations of the Parliamentary Committee of Inquiry into the administration of this grant now sitting, but whether Parliament gives the money necessary to carry them on, or whether they are closed and abandoned, as they assuredly will be if not taken over by the State, the work done at and in connection with these observatories is a record of investigation which will be growingly studied by meteorologists.

Edinburgh, October 17.

R. T. OMOND

No one is more conscious of the shortcomings and omissions of the address than its author. One correction I should like to make here. The joint editors of the *Meteorologische Zeitschrift* are Dr. Hann and Dr. Hellmann; Dr. Pernter is associated with the journal as "Herausgeber."

I cannot fail to be aware that, with perfect propriety, I might have devoted a large part, or even the whole, of the address to the obligations of meteorology to private enterprise in this country. In that case it would have been a different, perhaps a better, address, but I will ask your readers to believe that any omissions of that kind which they detect and regret were not due to a desire to belittle anything except the address itself.

In one sentence I did explicitly refer to Edinburgh and Ben Nevis. I cannot altogether emulate the achievement of Mr. Puff, who managed to extract so much meaning from a shake of Lord Burleigh's head, but I should like to say that if Sir Arthur Mitchell had used an appropriate magnifying power, and had got it properly focused upon that sentence, he would have read the following opinion which the mention of Ben Nevis always suggests to my mind, "that if means were found for endowing a chair of meteorology in the University of Edinburgh, and one of the distinguished Scottish meteorologists, whose names require no announcement from the chair to make them known to the British Association and far beyond, were appointed thereto, a most important and productive step would be taken towards the solution of the many problems connected with the great Scottish work of the Ben Nevis Observatories, the twenty-first annual report of which Dr. Buchan will present to the Association."

W. N. SHAW.

October 21.

NO. 1775, VOL. 69]

Weather Changes and the Appearance of Scum on Ponds.

IF any of your readers could explain an interesting natural phenomenon constantly occurring here we should be very grateful. It is simply that, invariably before any decided change of weather, there comes up a scum on the surface of the pool or small lake which skirts our south and east lawns—part of the pleasure grounds surrounding the mansion. Sometimes it looks like soapy water, but at other times it is black, and makes the breasts of our swans as black as ink just above the water-line. Then the scum will suddenly disappear, and the swans' breasts become white again. Our geological formation is the junction of the Upper Greensand and the Lower Chalk. The bottom of our lake is chalk; it is fed by springs, and the stream formed by its overflow runs finally into the Thames. It is shallow, and is surrounded by large trees. There are at present eight swans on it, also many moorhens and wild duck, and quantities of fish, which attract herons; kingfishers live in the bank, which is very high on the far side. There is also an island with large trees and a dense undergrowth.

PLATANUS ORIENTALIS.

Aston Rowant, Oxon.

WITH reference to the letter of "Platanus orientalis," it seems to me that a possible explanation of the appearance of dirty scum on the surface of the pond before any decided change of weather may be that a sudden change of barometric pressure may accelerate the flow of springs rising through the chalk of the floor of the pond. This would carry up to the surface of the water some of the fine mud which had rested on the chalk, or even lodged in crevices within it. When the flow of the springs diminished or ceased, the sediment would naturally subside once more. It would be interesting to keep an exact record of the appearance of the scum and of the variations of atmospheric temperature, pressure, and the rainfall by automatic recording instruments.

Without knowing the local conditions it would be impossible to speak definitely as to the sufficiency of this explanation.

Another that occurs to me is that, if the sediment at the bottom of the pond is of a flocculent character, its movements may be due to the same cause as those of the precipitate in a "storm-glass," whatever that cause may be; but in that case the appearance would probably be limited to dead calm weather.

It is possible that the scum may be organic, and it would be desirable to have it examined microscopically by a student of limno-plankton.

HUGH ROBERT MILL.

Cranial Casts.

IN the number of NATURE which arrived here to-day there is a report of the interesting presidential address delivered by Prof. Symington in Section H at the British Association's recent meeting. In this report there are several statements which are likely to prove misleading to those who are not familiar with the literature relating to brain-casts. The reader might imagine (see p. 540) that this was an entirely new branch of research suggested by Dr. Forsyth Major's work on the subfossil Lemuroids (1898) and only fully exploited by Prof. Schwalbe in 1902. This, of course, cannot be the meaning which Prof. Symington intended to convey, because he is quite familiar with the scores of cranial casts made in such profusion by Prof. Gervais in the years 1867-1871, and by a long line of anatomists and palæontologists both before and since that time, and with the valuable contributions to knowledge which have resulted from this fertile branch of study; in fact, Prof. Symington happened to visit the work-room in the Royal College of Surgeons in 1901 when I was examining and describing the considerable collection of such casts (representing more than one hundred genera) which have been brought together by the late Sir William Flower and the present conservator, Prof. C. Stewart. (And, with reference to Prof. Symington's remarks on curators, I may mention that no one more fully recognises the value of cranial casts than the present conservator of the Royal College of Surgeons' Museum.)

But more remarkable than this is the statement:—"This method has been applied with marked success to the determination of the characters of the brain in various fossil lemurs by Dr. Forsyth Major and Prof. R. Burckhardt" (p. 540). The "marked success" of Prof. Burckhardt consisted in flatly contradicting in almost every essential feature the *correct* account of the same specimen given by Dr. F. Major, as I have pointed out in a work (*Trans. Linnean Soc.*, February, see especially p. 365) published seven months ago. Prof. Symington could not have chosen out of the scores of memoirs on cranial casts an example more likely to bring contempt on the method he so eloquently and so justly extols.

His statement that "so far as prehistoric man is concerned, we can never hope to have any direct evidence of the condition" of the brain is stultified by the fact (which I mentioned fifteen months ago in the *Journ. of Anat. and Phys.*, July, 1902) that I have in my possession a large series of actual prehistoric brains with the crania from which they were derived. Many of these are so excellently preserved that every detail of the convolutionary pattern can be recognised, and by transferring it to the surface of the cranial cast an accurate model showing exactly the size, shape, and arrangement of the sulci with perfect accuracy can be obtained. That I am not exaggerating the excellence of these prehistoric relics may be seen from the brain fragment (D. 691) in the galleries of the Royal College of Surgeons' Museum, especially when I add that I possess whole hemispheres in even a better state of preservation.

As to the method of interpreting human brain casts, if we follow Prof. Symington's advice and begin by identifying the Sylvian fissure as the groove produced by the orbito-sphenoid ("as is well known, the marked prominence at the base of the human skull separating the anterior from the middle fossa fits into the deep cleft between the frontal and temporal lobes of the brain") we shall fall into grave error in many cases. It sometimes happens (in more than 50 per cent. of my collection of "Greek" and "Turkish" hemispheres) that the orbito-sphenoid lies far in front of (and not *in*) the Sylvian fissure, mapping out a great "post-orbital limb" (Spitzka) of the frontal lobe, which has slipped over into the middle cranial fossa. I have seen the Sylvian fissure lying as far as 1 cm. behind the orbito-sphenoid (in a Syrian brain), and a prominent crest derived from the alisphenoid projecting into it.

It is surprising to find Prof. Symington repeating that time-worn fallacy:—the inferior frontal convolution "is well known to be much more highly developed in man than in the anthropoid apes" (p. 541). For if we follow the lead of Profs. Marchand and Cunningham—and to anyone who really examines the facts of the case there is no other alternative—the inferior frontal sulcus is represented in the apes by the sulcus rectus, and the inferior frontal convolution is *relatively much bigger* in the apes than in man.

Every anthropologist will cordially re-echo Prof. Symington's wish that information concerning large series of non-European brains may soon be forthcoming. But that we know so little concerning these other types of the human brain is not wholly the fault of the people who have access to such material. The chief blame must rest on those anatomists who, with every advantage which museums, libraries, and trained assistants confer, have done so little to provide data relating to the European types of brain which are of any anthropological value. I know several anatomists in various parts of the world who have the material and are merely awaiting a "lead" as to which features of the brain are of anthropological importance and are worthy of being recorded.

I have recently met with the same difficulty. After having examined six hundred Egyptian, Soudanese, and a varied assortment of other non-European brains, I am unable to acquire from the writings of European anatomists just that information of the European types of brain which I need for purposes of comparison; moreover, I am unable to publish the anthropological results of my work in any satisfactory form until I have discussed such purely morphological questions as the real constitution of the fissure of Sylvius and have unravelled the intricacies of the parieto-occipital regions of the brain. When the "home" anatomists have done their part of the work, the rest will soon follow.

G. ELLIOT SMITH.

The School of Medicine, Cairo, October 7.

NO. 1775, VOL. 69]

I HAVE to thank you for your courtesy in allowing me the opportunity of reading a letter which Prof. G. Elliot Smith has addressed to you, criticising various statements in my presidential address in Section H of the British Association at Southport. Prof. Smith has raised so many points that I have only time, at present, to reply to a few of them.

What a reader "might imagine" I will not attempt to picture, but I certainly had no intention of implying that only the three investigators I happened to mention had worked at the subject of cranial casts, or that "it was an entirely new branch of research."

I endeavoured to show that the examination of a skull was necessarily incomplete until the interior of its cranial cavity was exposed and cast, and that, although such methods were calculated to afford valuable information as to the relation between the external and internal surfaces of the cranial wall, and to give an important indication of the form of the brain it once contained, yet the curators of museums appeared to have an invincible objection to making the necessary section, and the practice of taking casts of the cranial cavity had been too much neglected by craniologists. I gave as an illustration of the usual custom of preserving skulls entire the Hunterian Museum in London, and this selection appears to have been a source of offence to Prof. Smith, although he does not disprove my statement. His remarks as to the number of casts of different genera in that museum are quite beside the mark. I was referring to the very large collection of human skulls, and, so far as I have been able to ascertain, no systematic attempt has been made to examine more than a small fraction of them in this way. I know that many curators object strongly to the skulls under their care being bisected, and believe that at any rate their appearance would be seriously affected by such an operation. I ventured to advocate a method which, in my opinion, has not been followed to any marked extent in the collection of human crania in the Hunterian Museum or elsewhere in this country, and trust I was at liberty to do this without it being regarded as a personal attack upon the conservator, for whom I have the very highest regard.

Prof. Smith objects to my statement that "we can never hope to have any direct evidence of the condition of the higher nerve centres of prehistoric man" on the ground that he has collected a large series of such brains from Egyptian cemeteries, and he refers to a paper he published in the *Journal of Anatomy and Physiology* last year. I had the pleasure of reading his paper when it appeared, and although his specimens were of great interest, it seemed to me that their state of preservation was not sufficiently good to be of much use for the accurate determination of the numerous details which it would be necessary to know, when comparing them with modern brains. The specimens had undergone marked diminution in size, and in places were considerably distorted. Further, from the actual photographs (Plate xiv.) which he gave it appeared to me that a considerable restoration would be needed when attempting to limit the boundaries of the cerebral fissures. I hope that the impression left upon my mind from the perusal of his paper may be an erroneous one, and that the additional evidence promised by Prof. Smith will dissipate my doubts.

I do not quite appreciate the cautiousness of those anatomists who are waiting for a "lead" before describing the specimens of non-European brains in their possession. The numerous memoirs that have been hitherto published on the cerebral convolutions are based almost entirely upon the study of European brains, and what we obviously require is a careful and an unbiased account of the cerebral fissures and convolutions of other races. If Prof. Smith and his friends wait until the favoured "home" anatomists agree as to the "types" of European brains, and until he has definitely settled for us all the morphological problems connected with the cerebral cortex, we shall, I fear, need a large store of patience.

In conclusion, I should like to assure Prof. Smith that if I did not refer specially to his work it was not because I do not appreciate its value, but on account of the limitations in time and space necessary in the circumstances of my address.

J. SYMINGTON.

October 19.